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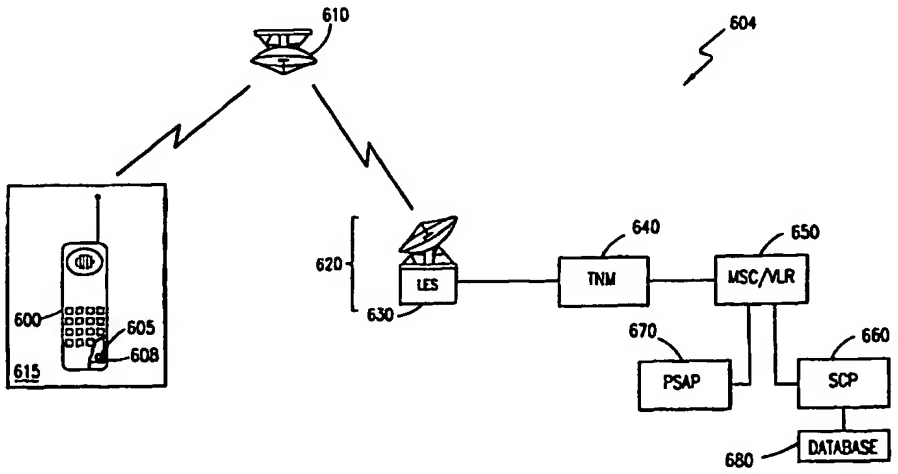

(57) Abstract

A telecommunications system and method for allowing a real–time lookup into a database within the Intelligent Network (IN) to determine regulatory requirements in a specific area. For example, the present invention makes use of the Intelligent Network (IN) to perform filtering of lawful intercept calls by including within the database valid legal intercept/country combinations. In addition, implementing this database within, for example, the Intelligent Network (IN), allows the Mobile Services Center (MSC) managing the service area, the Mobile Station (MS) is in, to send a message containing both the subscriber information and the geographic location of the subscriber to an IN node when an emergency call is placed. The IN node can then respond with the routing number corresponding to the most appropriate Public Safety Answering Point (PSAP).

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REGULATORY DATABASE WITHIN THE INTELLIGENT NETWORK

BACKGROUND OF THE PRESENT INVENTION

Field of the Invention

The present invention relates generally to telecommunications systems and methods for determining regulatory requirements for a specific service area, and specifically to providing a database within the Intelligent Network, which can contain, for example, legal intercept information, emergency call routing information, and Calling Line Restriction information.

Background and Objects of the Present Invention

Cellular telecommunications is one of the fastest growing and most demanding telecommunications applications ever. Today it represents a large and continuously increasing percentage of all new telephone subscriptions around the world. A standardization group, European Telecommunications Standards Institute (ETSI), was established in 1982 to formulate the specifications for the Global System for Mobile Communication (GSM) digital mobile cellular radio system.

With reference now to FIGURE 1 of the drawings, there is illustrated a GSM Public Land Mobile Network (PLMN), such as cellular network 10, which in turn is composed of a plurality of areas 12, each with a Mobile Services Center (MSC) 14 and an integrated Visitor Location Register (VLR) 16 therein. The MSC/VLR areas 12, in turn, include a plurality of Location Areas (LA) 18, which are defined as that part of a given MSC/VLR area 12 in which a mobile station (MS) 20 may move freely without having to send update location information to the MSC/VLR area 12 that controls the LA 18. Each Location Area 12 is divided into a number of cells 22. Mobile Station (MS) 20 is the physical equipment, e.g., a car phone or other portable phone, used by mobile subscribers to communicate with the cellular network 10, each other, and users outside the subscribed network, both wireline and wireless. The MS may also include a Subscriber Identity Module (SIM) 13, which provides storage of subscriber related information, such as the International Mobile Subscriber Identity (IMSI) 15, which uniquely identifies a subscriber.

The MSC 14 is in communication with at least one Base Station Controller (BSC) 23, which, in turn, is in contact with at least one Base Transceiver Station

(BTS) 24. The BTS is the physical equipment, illustrated for simplicity as a radio tower, that provides radio coverage to the geographical part of the cell 22 for which it is responsible. It should be understood that the BSC 23 may be connected to several base transceiver stations 24, and may be implemented as a stand-alone node or integrated with the MSC 14. In either event, the BSC 23 and BTS 24 components, as a whole, are generally referred to as a Base Station System (BSS) 25.

With further reference to FIGURE 1, the PLMN Service Area or cellular network 10 includes a Home Location Register (HLR) 26, which is a database maintaining all subscriber information, e.g., user profiles, current location information, International Mobile Subscriber Identity (IMSI) numbers, and other administrative information. The HLR 26 may be co-located with a given MSC 14, integrated with the MSC 14, or alternatively can service multiple MSCs 14, the latter of which is illustrated in FIGURE 1.

The VLR 16 is a database containing information about all of the Mobile Stations 20 currently located within the MSC/VLR area 12. If a MS 20 roams into a new MSC/VLR area 12, the VLR 16 connected to that MSC 14 will request data about that Mobile Station 20 from the HLR database 26 (simultaneously informing the HLR 26 about the current location of the MS 20). Accordingly, if the user of the MS 20 then wants to make a call, the local VLR 16 will have the requisite identification information without having to reinterrogate the HLR 26. In the aforedescribed manner, the VLR and HLR databases 16 and 26, respectively, contain various subscriber information associated with a given MS 20.

It should be understood that the aforementioned system 10, illustrated in FIGURE 1, is a terrestrially-based system. In addition to the terrestrially-based systems, there are a number of satellite systems, which work together with the terrestrially-based systems to provide cellular telecommunications to a wider network of subscribers. Within a satellite-based network, as shown in FIGURE 2 of the drawings, a system of satellites 200 in orbit are used to provide communication between Mobile Stations (MS) 210 and the land-based part of the network, called the Satellite Access Node (SAN) 220. The SAN 220 consists of equipment for communicating with the satellites 200 and through the satellites 200 to the Mobile Stations 210. The antennae and satellite tracking part of the system is the Radio Frequency Terminal (RFT) subsystem 230, which also provides for the connection of

the communication path to the satellite 200. Connected to the RFT 230 is a Land Earth Station (LES) 240, which is similar in function to a combination of the Base Transceiver Station (BTS) 24 and the Base Station Controller (BSC) 23 for GSM based systems, as shown in FIGURE 1. Land Earth Stations (LESs) coordinate communications to and from the satellite 200 and the respective local systems servicing the area, e.g., other cellular systems 10 attached to the satellite-based system 205.

In some satellite networks, a function exists in the LES 240 for calculating what "Service Area" 250 a system access is being requested from. This Service Area 250 can in turn be mapped onto a country or state for the purpose of disabling ciphering or routing emergency calls, e.g., 911 calls, to the nearest emergency center in order to meet regulatory requirements and to provide the correct language set. This Service Area handling for satellite networks is analogous to cell handling in conventional terrestrial cellular networks, except that in terrestrial networks, a cell is not defined by position calculations, but rather a cell is based on a radio coverage area. One of several ways that emergency calls are currently routed is based on the location number assigned to the cell identity. For the normal PLMN case, this information is sufficient to route the call to the closest Public Safety Answering Point (PSAP), but for satellite systems, the cells are much larger, which makes it impossible to accurately route the emergency call to the appropriate PSAP.

A Terrestrial Network Manager (TNM) 280 performs some of the functions of the BSC 23 of FIGURE 1 as well as additional functions unique to satellite based systems, such as multi-SAN paging and routing of registration messages to the correct MSC/VLR 290. One key function of the TNM 280 is the ability to map paging requests (which are broadcast messages to the MS 210, using the IMSI 15, to instruct the MS 210 to respond, e.g., by sending a CM SERVICE REQUEST message), using X,Y coordinates, onto the resources needed to execute the paging. In other words, based on the coordinates, the TNM 280 can determine which LES 240 is the most suitable for paging. In addition, the TNM 280 consults a database 260, which includes a set of tables, to decide which Channel Managers, contained within the LES 240, and satellite beams should be used for paging.

For certain kinds of networks, especially satellite-based systems, there exists a problem in determining the legal requirements for a call in a particular location.

Three examples of situations where legal requirements may vary in a particular service area are: Calling Line Identity Restriction Information, e.g., preventing the called party from ascertaining the identity of the calling party, legal intercept information, and dialing patterns for emergency calls.

For example, a subscriber may be marked for legal intercept, e.g., wiretapping, by a legal authority within certain geographical areas designated to that legal authority, for instance, certain countries. That subscriber may also be marked by several other legal authorities, each of whom has authority for intercept in one or more countries. At present, there is no known method of routing intercepted traffic to only those who are authorized to receive it, based on the physical location of the subscriber. In addition, it would be preferable to provide this intercept capability without it being detectable by the subscriber or interfering with that subscriber's features.

In addition, as noted above, it is currently impossible to accurately route emergency calls to the appropriate PSAP. Furthermore, with the advent of "Caller ID", which displays the Calling Party Name and Number Information to the called party with the ringing of the call, jurisdictional variances exist concerning the legality of allowing the calling party to restrict the presentation of its identity (name and number). Ascertaining whether a specific jurisdiction, e.g., a state or country, permits this Calling Line Restriction Information to be displayed, e.g., "Private Caller", becomes difficult when the call is being placed through a satellite covering several different jurisdictions. Therefore, a need has arisen for a database, accessible by satellite systems, to determine the jurisdictional requirements regarding Calling Line Restriction Information.

It is therefore an object of the invention to provide a database within the Intelligent Network which contains information regarding the legal requirements for a specific service area.

It is a further object of the invention to provide a database within the Intelligent Network which contains legal intercept information for a specific service area, in order to accurately route calls to the appropriate legal authority based on the location of the subscriber without effecting that subscriber's services.

It is still a further object of the invention to provide a database within the Intelligent Network which contains emergency routing information for a specific service area, in order to accurately route emergency calls to the appropriate PSAP.

It is still a further object of the invention to provide a database within the Intelligent Network which contains jurisdictional requirements regarding Calling Line Restriction Information.

SUMMARY OF THE INVENTION

The present invention is directed to a telecommunications system and method for allowing a real-time lookup into a database within the Intelligent Network to determine regulatory requirements in a specific area. For example, the present invention makes use of the Intelligent Network to perform filtering of lawful intercept calls by including within the database valid legal intercept/country combinations. In addition, implementing this database within, for example, the Intelligent Network (IN), allows a Mobile Services Center (MSC) to send a message containing both subscriber information and the geographic location of the subscriber to an IN node when an emergency call is placed. The IN node can then respond with the routing number corresponding to the most appropriate PSAP. Furthermore, this database can contain the Calling Line Restriction Information for various jurisdictions, which can be easily accessible by satellite systems, in order to comply with jurisdictional requirements.

BRIEF DESCRIPTION OF THE DRAWINGS

The disclosed inventions will be described with reference to the accompanying drawings, which show important sample embodiments of the invention and which are incorporated in the specification hereof by reference, wherein:

FIGURE 1 is a block diagram of a conventional terrestrially-based wireless telecommunications system;

FIGURE 2 is a block diagram illustrating aspects of a sample satellite-based network;

FIGURE 3 is a block diagram illustrating some of the basic components used in an Intelligent Network or an Advanced Intelligent Network for signal switching;

FIGURE 4 is a flow chart illustrating steps in a sample embodiment of the present invention in which a legal requirements database is implemented in the Intelligent Network;

FIGURE 5 illustrates the interrelationship between a sample terrestrially-based wireless telecommunications system and the Intelligent Network in order to access

information regarding the legal requirements of a specific service area, without disrupting the subscriber's service, in accordance with preferred embodiments of the present invention;

FIGURE 6 depicts a sample satellite-based network in communication with the Intelligent Network for purposes of accessing information regarding the legal requirements for a specific service area in accordance with preferred embodiments of the present invention; and

FIGURE 7 is a flow chart describing steps in a sample embodiment of the present invention in which the database within the Intelligent Network stores valid legal intercept/location combinations.

DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EXEMPLARY EMBODIMENTS

The numerous innovative teachings of the present application will be described with particular reference to the presently preferred exemplary embodiment. However, it should be understood that this class of embodiments provides only a few examples of the many advantageous uses of the innovative teachings herein. In general, statements made in the specification of the present application do not necessarily delimit any of the various claimed inventions. Moreover, some statements may apply to some inventive features but not to others.

In modern telecommunications networks, signaling constitutes the distinct control infrastructure that enables provision of all other services. It can be defined as the system that enables stored program control exchanges, network databases, and other "intelligent" nodes of the network to exchange: (a) messages related to call setup, supervision, and tear-down; (b) information needed for distributed applications processing (inter-process query/response); and (c) network management information. The Intelligent Network (IN) and the new Advanced Intelligent Network (AIN) have made possible the transfer of all types of information through the telephone network without special circuits or long installation cycles.

The IN consists of a series of intelligent nodes, each capable of processing at various levels, and each capable of communicating with one another over data links. The basic infrastructure needed is composed of various signaling points, which both perform message discrimination (read the address and determine if the message is for

that node), and route messages to other signaling points. The basic three types of signaling points are: (1) Service Switching Points (SSPs); (2) Signal Transfer Points (STPs); and (3) Service Control Points (SCPs), each of which are described in more detail hereinafter.

With reference now to FIGURE 3 of the drawings, the many Service Switching Points (SSPs) 100 serve as the local exchanges in a telephone network 90, a portion of which is shown in FIGURE 3. The STP 110 serves as a router, and switches messages received from a particular SSP 100 through the network 90 to their appropriate destinations (another SSP 100). As is understood in the art, the STP 110 receives messages in packet form from the SSPs 100. These packets are either related to call connections or database queries. If the packet is a request to connect a call, the message must be forwarded to a destination end office (another SSP 100), where the call will be terminated.

If, however, the message is a database query seeking additional information, the destination will be a database. Database access is provided through the Service Control Point (SCP) 120, which does not store the information, but acts as an interface to a computer that houses the requested information.

In preferred embodiments of the present invention, a database, containing information regarding the legal requirements for a specific service area, is found within, for example, the Intelligent Network. This database will be accessible by the various Service Control Points 120, which are in communication with numerous MSCs (530 or 650) in both terrestrially-based systems 504, as shown in FIGURE 5, and satellite-based systems 604, as illustrated in FIGURE 6. The database (560 or 680) preferably supports a protocol to provide signaling information, which can be delivered across the Common Channeling Signaling (Signaling System #7) network. Such protocols include messages sent by Intelligent Network Application Part (INAP), Mobile Application Part (MAP) or Unstructured Supplementary Service Data (USSD).

With reference now to FIGURE 4 of the drawings, steps in a sample embodiment of the present invention are listed to provide a general framework for implementing a legal requirements database within the Intelligent Network. Initially, when a Mobile Station (MS) (500 or 600) requests a location update (step 400), the Location Update Request message is forwarded to the MSC/VLR (530/540 or 650) by either the LES 630 and the TNM 640 of satellite-based systems 604 or the BTS 520

and the BSC 525 of terrestrially-based systems 504 (step 410). This location information is then transmitted, for example, by an Unstructured Supplementary Service Data (USSD) message, or some form of Man Machine Interface (MMI) message, transparently to the MSC 530 (step 410) via the BTS 520 and the BSC 525. A USSD handler within the MSC 530 then retrieves the USSD message and extracts the encapsulated data, as is well understood in the art.

Thereafter, the location information regarding the position of the MS 500 within the network 504 along with a legal requirements query is sent from the MSC 530 to the SCP 550 (step 420), e.g., through INAP or MAP. The SCP 550 then accesses the database 560 to determine the regulatory requirements associated with that location (510 or 515) (step 430). These requirements are then returned to the MSC 530 from the SCP 550 (step 440) for further processing, e.g., for legal intercept requirements, the MSC 530 then routes the call to the appropriate legal authority or monitoring center (MC) 570 corresponding to the valid warrants for the position included in the query.

In alternative embodiments, a query can be sent through MAP from the MSC 530 to a Home Location Register 545, which is interfaced with a Service Control Point (SCP) 548. Another option would be to house the database in the Home Location Register 545 itself, such embodiment not being shown. However, this would have the disadvantage that the database must be implemented in each Home Location Register 545 within the network 504. A further possible alternative is to install the database together with the MSC 530 via a dedicated connection, such embodiment not being shown. In this way, the MSC 530 is connected directly to the node housing the database, e.g., via an Ethernet connection, instead of transmitting the query to the SCP 550. However, this has the same disadvantage as locating the database within the HLR 545, in that a database must be installed for each MSC 530 or switch.

The location information can be encoded in a number of different ways, including, but not limited to, Cell Global Identifiers, Location Area Identifiers, X, Y coordinates (corresponding to latitude and longitude, which is primarily used by satellite systems 604), or incoming Trunkgroup Identifiers (corresponding to the actual trunklines from the BSS 520/525 to the MSC/VLR 530/540).

As an example, in one embodiment of the present invention, which is discussed in connection with FIGURE 5 of the drawings and illustrated in FIGURE 7 of the

drawings, the regulatory information stored within the database 560 in the IN preferably consists of legal entities having the authority to intercept calls for certain subscribers and the corresponding service areas where such authority resides. Initially, the MSC 530 must determine the identity and location of the MS 500 (step 700), e.g., by the MS 500 registering in the VLR 540 serving the cell 510 or Location Area 515 it is in and sending the Cell Global Identification or Location Area Identification Information to the MSC 530 via the BTS 520 and BSC 525. For terminating calls, the MS 500 location as represented by position information stored in the VLR 540 responsible for the service area 515 the MS 500 is in can be used. Alternatively, if the MS 500 has roamed into a new location area 515 and has not updated its location with the network 504, a page request can be sent to the MS 500 instructing the MS 500 to respond with its current location, which can be determined by the information sent from the Short Message System (SMS) broadcast channel 502 or the regular broadcast channel, not shown, from the BTS 520.

Thereafter, an "Intercept Application" 532 within the MSC 530 checks the identity of the subscriber, e.g., the IMSI 508 within the SIM 505, against a list of subscribers 534 stored in the MSC 530, e.g., as a database, that are marked for intercept anywhere within the service area 515 (step 710). If the subscriber is on the list 534, the "Intercept Application" 532 within the MSC 530 initiates IN services and sends that identity information and location information, e.g., Cell Global Identifier, Location Area Identifier, X,Y coordinates, Trunkgroup Identifier, etc., along with an intercept query, to a Service Control Point 550 within the IN (step 720). If, however, the subscriber is not marked for intercept within the MSC's 530 service area 515, the call continues normally (step 730), such processing being well known in the art. Alternatively, the MSC 530 could query each time regardless of whether the MS 500 has been marked.

In order to prevent the subscriber from realizing that the MS 500 has been marked for intercept, the query process (step 720) is performed simultaneously to normal call processing (step 730). Such queries (step 720) can normally take up to five or six seconds, and if performed prior to normal call processing (step 730), would enable the subscriber to recognize that the MS 500 is being monitored.

The SCP 550 then accesses the database 560 storing the legal intercept information (step 740), determines if the MS 500 is within a location designated to a

legal authority to monitor the call, and returns that information to the "Intercept Application" 532 within the MSC 530 (step 750). If no valid legal authority is found, the call continues normally (step 730), but if one or more legal authorities are authorized to monitor the call while the MS 500 is within that location (510 or 515), the "Intercept Application" 532 within the MSC 530 establishes a monitoring link 575 with the appropriate intercept center or monitoring center (MC) 570 (step 760). Thereafter, or simultaneous with the database query process described hereinbefore, the original call is established (step 770), and a copy of the digitized speech that passes through the switching matrix within the MSC 530 is routed via the monitoring link 575 to the monitoring center (MC) 570 (step 780), e.g., a tape recorder.

In an additional embodiment of the present invention, which is shown in FIGURE 6 of the drawings, the database 680 within the IN consists of routing numbers to Public Safety Answering Points (PSAPs) 670 and the service areas 615 corresponding to the routing numbers. Thus, when an emergency call is made from an MS 600 within a satellite-network 604, the MSC/VLR 650 sends a message containing both subscriber information, e.g., the IMSI 608 within the SIM 605, and the geographic location 615, e.g., X, Y coordinates (latitude and longitude), Cell Global Identifier, or Trunkgroup Identifier, of the subscriber, to a Service Control Point (SCP) 660. The location information is initially transmitted through a satellite 610 to a Satellite Access Node (SAN) 620, and then to a Terrestrial Network Manager (TNM) 640, before being sent to the MSC/VLR 650.

The SCP 660 then responds with the routing number, which is a 10 digit number corresponding to the most appropriate PSAP 670. Thereafter, the MSC 650 will use the received 10 digit routing number to reach the appropriate PSAP 670. Advantageously, the interface to the PSAP 670 is not modified, and therefore the MSC 650 can connect the call to the appropriate PSAP 670 without requiring any of the protocols to be changed.

In a further alternative embodiment, the database 680 can contain information regarding the Calling Line Restriction requirements for various service areas. For example, one country or state might permit the display of calling party name and number information, while another country or state might prohibit such information from being displayed. Therefore, when a call is placed to or from a mobile station 600, and the called party lives in an area which restricts the display of the calling party

name and number information to the called party, especially within a satellite-network 604, the Land Earth Station (LES) 630 within the Satellite Access Node (SAN) 620 will determine the service area 615, e.g., X, Y coordinates, or Cell Global Identifier, that the MS 600 is in, and forward this information to the MSC 650 via the TNM 640.

Thereafter, the MSC 650 will send a query to the SCP 660, along with the location information, to determine if the called party lives in an area which restricts the calling party name and number information from being displayed to the called party. If the called party does live in an area which restricts such information from being displayed, a message indicating that the Calling Line Restriction service is applicable for this call will be sent to the calling party. Otherwise, the call continues normally.

As will be recognized by those skilled in the art, the innovative concepts described in the present application can be modified and varied over a wide range of applications. Accordingly, the scope of patented subject matter should not be limited to any of the specific exemplary teachings discussed.

WHAT IS CLAIMED IS:

1. A telecommunications system for determining a given one of a plurality of regulatory information for a location when a given one of a plurality of mobile terminals is within said location, said telecommunications system comprising:

a mobile services center in wireless communication with said given mobile terminal, said location being determined by said mobile services center;

an intelligent node in communication with said mobile services center, said location being forwarded to said intelligent node by said mobile services center; and

a database interfaced with said intelligent node, said database having said plurality of regulatory information stored therein, said given regulatory information being associated with said location, said intelligent node accessing said given regulatory information within said database and sending said given regulatory information to said mobile services center.

2. The telecommunications system of Claim 1, wherein said plurality of regulatory information consists of a list of intercept authorities, each of said intercept authorities having at least one service area associated therewith, said location being compared with each said service area to determine a valid area, said given regulatory information being said intercept authorities associated with said valid area.

3. The telecommunications system of Claim 2, wherein said given mobile terminal has an identity associated therewith.

4. The telecommunications system of Claim 3, wherein said identity is an International Mobile Subscriber Identity.

5. The telecommunications system of Claim 3, wherein said mobile services center has a subscriber identity database therein, said identity of said given mobile terminal being compared with said subscriber identity database, said intelligent node accessing said given regulatory information when said identity of said given mobile terminal is within said subscriber identity database.

6. The telecommunications system of Claim 2, wherein said mobile services center has an intercept application therein, said intercept application forwarding said location to said intelligent node and receiving said given regulatory information associated with said location from said intelligent node.

7. The telecommunications system of Claim 2, further comprising a monitoring center corresponding to said intercept authority associated with said valid location, said mobile services center establishing a monitoring link to said monitoring center.

8. The telecommunications system of Claim 7, wherein said monitoring center is a tape recorder.

9. The telecommunications system of Claim 1, wherein said plurality of regulatory information consists of a plurality of emergency numbers, each of said emergency numbers having a service area associated therewith, said location being compared with each said service area to determine a valid area, said given regulatory information being said emergency number associated with said valid area.

10. The telecommunications system of Claim 9, wherein said emergency numbers are ten-digit numbers associated with one of a plurality of Public Safety Answering Points.

11. The telecommunications system of Claim 1, wherein said plurality of regulatory information consists of Calling Line Restriction requirements, each of said Calling Line Restriction requirements having a service area associated therewith, said location being compared with each said service area to determine a valid area, said given regulatory information being said Calling Line Restriction requirement associated with said valid area.

12. The telecommunications system of Claim 1, wherein said intelligent node is a Service Control Point within the Intelligent Network.

13. The telecommunications system of Claim 1, further comprising a base station system connected to said mobile services center, said given mobile terminal being in wireless communication with said base station system.

14. The telecommunications system of Claim 13, wherein said base station system comprises a base transceiver station and a base station controller, said location being transmitted transparently from said base transceiver station and said base station controller to said mobile services center.

15. The telecommunications system of Claim 1, wherein said location is transmitted from said mobile services center to said intelligent node using an unstructured supplementary service data message.

16. The telecommunications system of Claim 1, wherein said location is transmitted from said mobile services center to said intelligent node using an Intelligent Network Application Part message.

17. The telecommunications system of Claim 1, wherein said location is transmitted from said mobile services center to said intelligent node using a Mobile Application Part message.

18. The telecommunications system of Claim 1, further comprising a Home Location Register connected to said mobile services center and said intelligent node, said location being forwarded to said intelligent node via said Home Location Register.

19. The telecommunications system of Claim 18, wherein said database is located within said Home Location Register.

20. The telecommunications system of Claim 1, further comprising a satellite access node connected to a terrestrial network manager, said terrestrial network manager being connected to said mobile services center, said satellite access node comprising a radio frequency terminal and a land earth station, said land earth

station determining said location and forwarding said location to said mobile services center via said terrestrial network manager.

21. The telecommunications system of Claim 1, wherein said location is selected from the group consisting of: a Cell Global Identifier, a Location Area Identifier, a Trunkgroup Identifier, and a set of coordinates based on the latitude and longitude of said given mobile terminal.

22. The telecommunications system of Claim 1, wherein said database is co-located with said mobile services center.

23. The telecommunications system of Claim 1, wherein said telecommunications system is a satellite-based system.

24. The telecommunications system of Claim 1, wherein said telecommunications system is a terrestrially-based system.

25. A method for determining a given one of a plurality of regulatory information for a location within a telecommunications system when a given one of a plurality of mobile terminals is within said location, said method comprising the steps of:

determining said location, using a mobile services center within said telecommunications system, said mobile services center being in wireless communication with said given mobile terminal;

sending said location to an intelligent node in communication with said mobile services center;

accessing a database interfaced with said intelligent node, said database having said plurality of regulatory information stored therein, said given regulatory information being associated with said location;

determining, by said intelligent node, said given regulatory information associated with said location; and

sending, by said intelligent node, said given regulatory information to said mobile services center.

26. The method of Claim 25, wherein said plurality of regulatory information consists of a list of intercept authorities, each of said intercept authorities having at least one service area associated therewith, said location being compared with each said service area to determine a valid area, said given regulatory information being said intercept authority associated with said valid area.

27. The method of Claim 26, wherein said given mobile terminal has an identity associated therewith.

28. The telecommunications system of Claim 27, wherein said mobile services center has a subscriber identity database therein, and further comprising the step of: before said step of sending said location, comparing said identity of said given mobile terminal with said subscriber identity database, by said mobile services center, said step of determining said given regulatory information being performed when said identity of said given mobile terminal is within said subscriber identity database.

29. The method of Claim 26, wherein said mobile services center has an intercept application therein, said step of sending said location being performed by said intercept application, said intercept application receiving said given regulatory information associated with said location from said intelligent node.

30. The method of Claim 26, wherein said telecommunications system further comprises a monitoring center corresponding to said intercept authority associated with said valid location, and further comprising the step of: after said step of sending said given regulatory information, establishing a monitoring link to said monitoring center, using said mobile services center.

31. The method of Claim 25, wherein said plurality of regulatory information consists of a plurality of emergency numbers, each of said emergency numbers having a service area associated therewith, said location being compared with each said service area to determine a valid area, said given regulatory information being said emergency number associated with said valid area.

32. The method of Claim 31, wherein said emergency numbers are ten-digit numbers associated with one of a plurality of Public Safety Answering Points.

33. The method of Claim 25, wherein said plurality of regulatory information consists of Calling Line Restriction requirements, each of said Calling Line Restriction requirements having a service area associated therewith, said location being compared with each said service area to determine a valid area, said given regulatory information being said Calling Line Restriction requirement associated with said valid area.

34. The method of Claim 25, wherein said intelligent node is a Service Control Point within the Intelligent Network.

35. The method of Claim 25, wherein said telecommunications system further comprises a base station system connected to said mobile services center, said given mobile terminal being in wireless communication with said base station system,

and further comprising the step of: before said step of sending said location, transmitting said location transparently from said base station system to said mobile services center.

36. The method of Claim 25, wherein said telecommunications system further comprises a Home Location Register connected to said mobile services center and said intelligent node, said step of sending said location being performed by forwarding said location to said intelligent node via said Home Location Register.

37. The method of Claim 36, wherein said database is located within said Home Location Register..

38. The method of Claim 25, wherein said database is located within said intelligent node.

39. The method of Claim 25, wherein said database is co-located with said mobile services center.

40. The method of Claim 25, wherein said telecommunications system further comprises a satellite access node connected to a terrestrial network manager, said terrestrial network manager being connected to said mobile services center, said satellite access node comprising a radio frequency terminal and a land earth station, said step of determining said location being performed by said land earth station determining said location and forwarding said location to said mobile services center via said terrestrial network manager.

41. The method of Claim 25, wherein said telecommunications system further comprises a Visitor Location Register connected to said mobile services center, said step of determining said location being performed by said mobile services center retrieving said location of said given mobile terminal from said Visitor Location Register.

42. The method of Claim 25, wherein a subscriber associated with said

given mobile terminal does not detect said method when said subscriber is using said given mobile terminal.

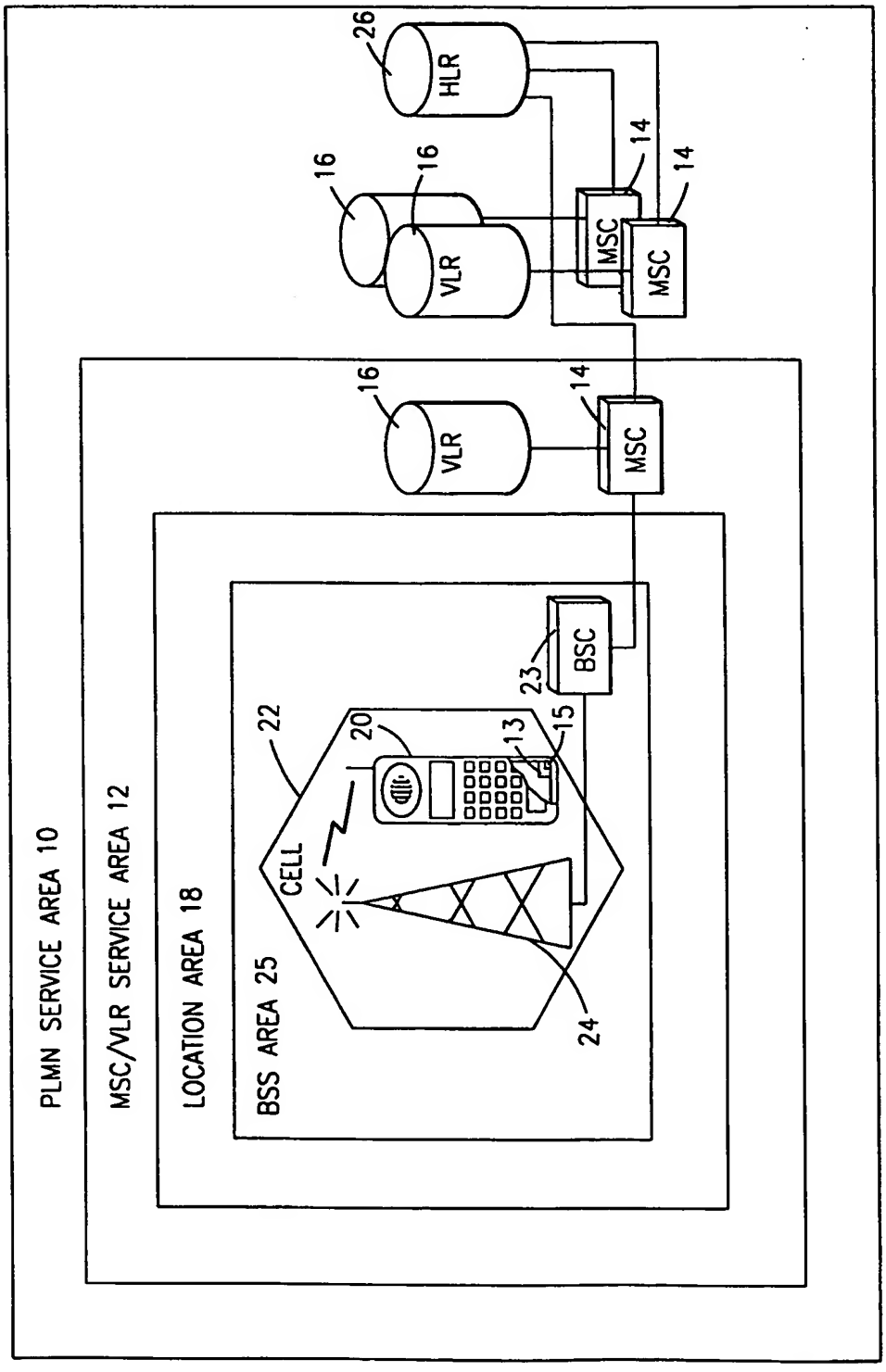
PLMN SERVICE AREA 10
MSC/VLR SERVICE AREA 12
LOCATION AREA 18
BSS AREA 25
CELL
HLR
VLR
VLR
MSC
MSC
MSC
BSC
26
16
16
16
14
14
14
23
22
20
13
15
24

FIG. 1

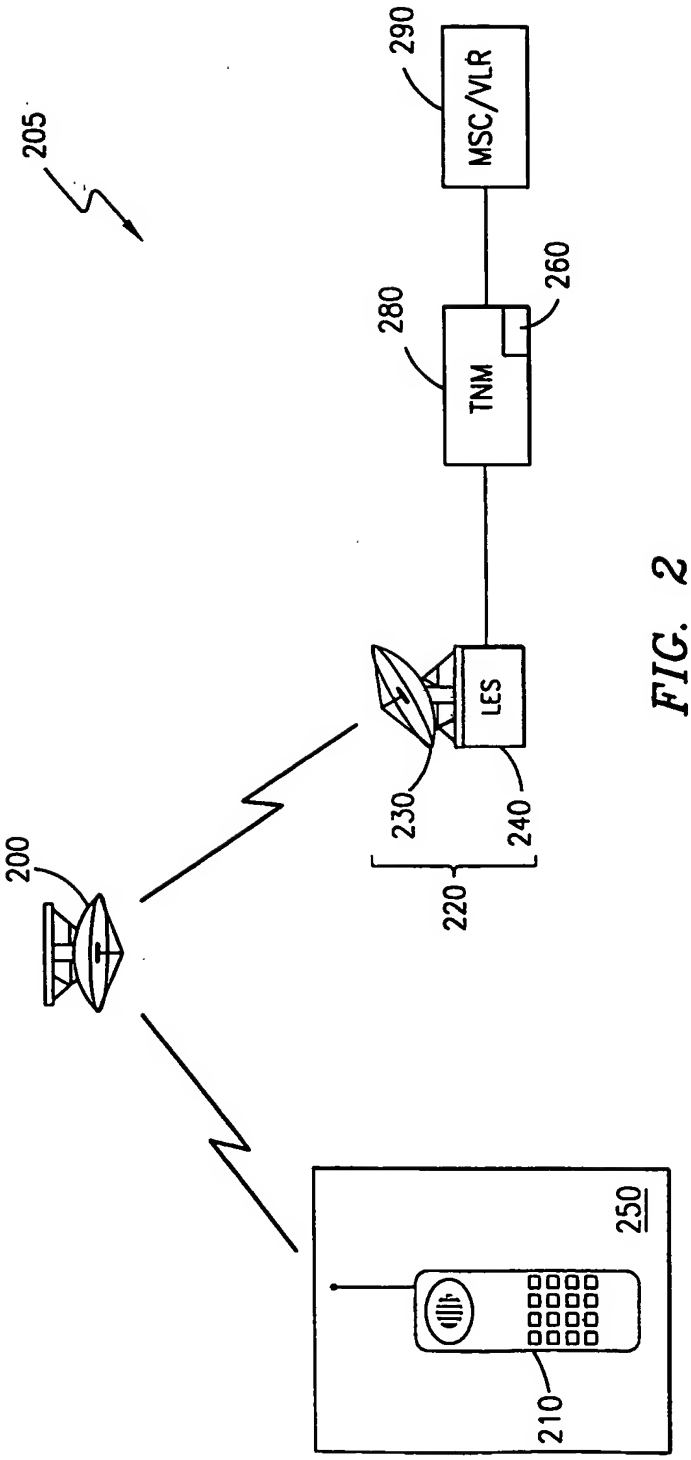

FIG. 2

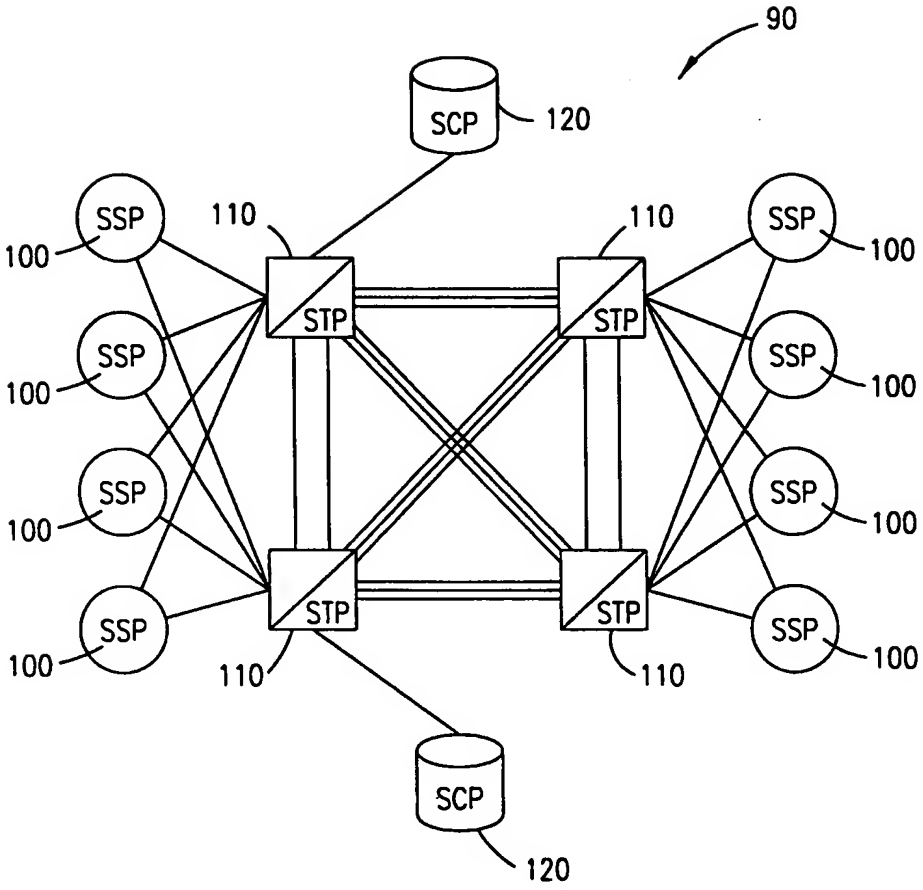
90
SCP
120
SSP
100
110
STP
SSP
100
SSP
100
SSP
100
110
STP
SSP
100
SSP
100
SSP
100
STP
STP
110
110
SCP
120

FIG. 3

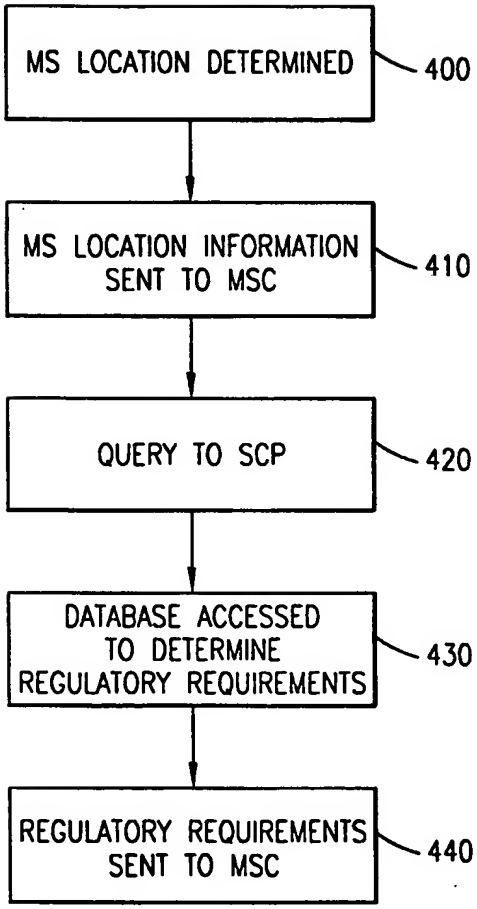
MS LOCATION DETERMINED
400
MS LOCATION INFORMATION SENT TO MSC
410
QUERY TO SCP
420
DATABASE ACCESSED TO DETERMINE REGULATORY REQUIREMENTS
430
REGULATORY REQUIREMENTS SENT TO MSC
440

FIG. 4

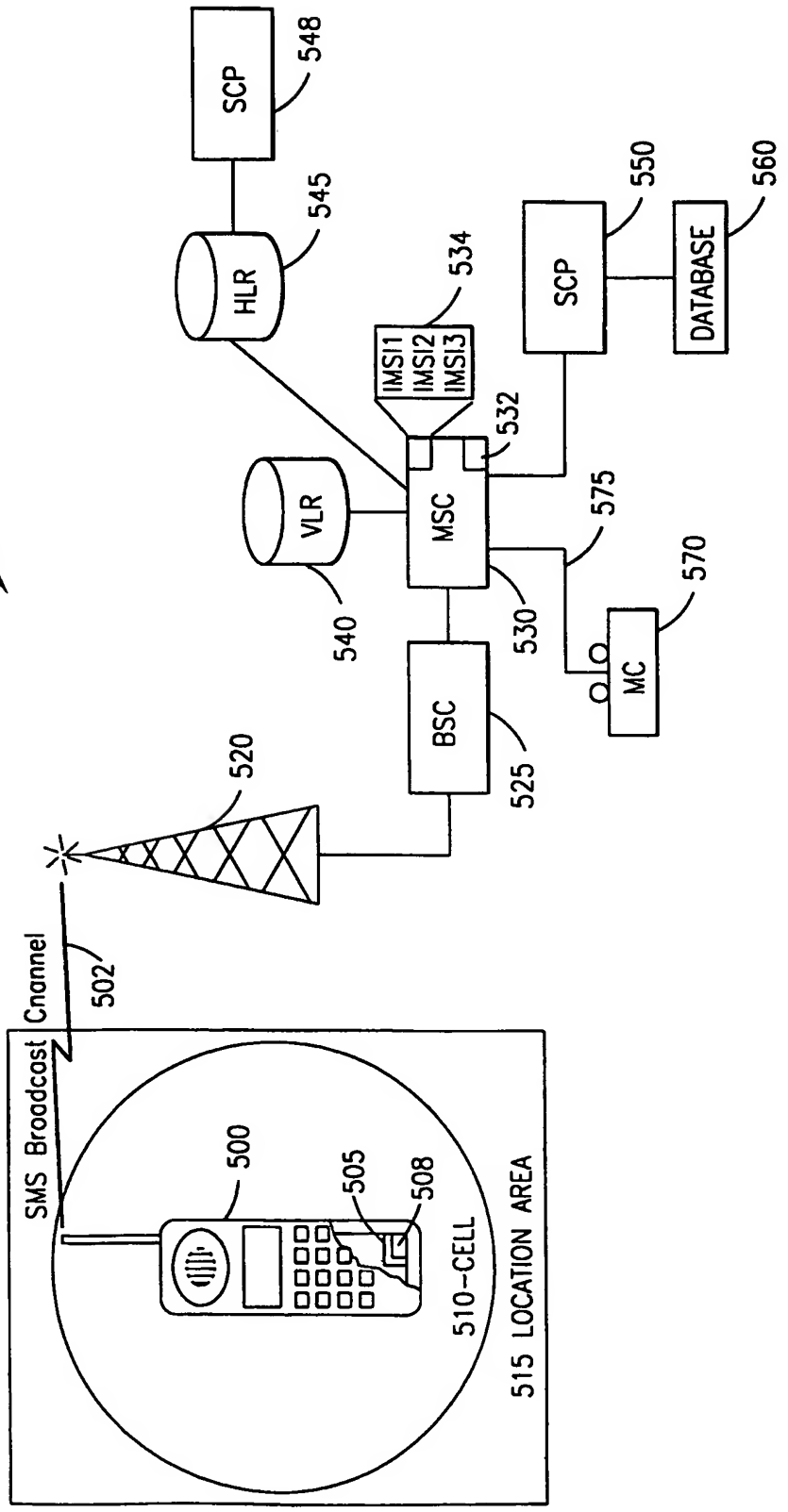
SCP
548
HLR
545
IMSI1
IMSI2
IMSI3
534
SCP
550
DATABASE
560
504
VLR
MSC
532
575
540
530
MC
570
BSC
525
520
SMS Broadcast Channel
502
500
505
508
510-CELL
515 LOCATION AREA

FIG. 5

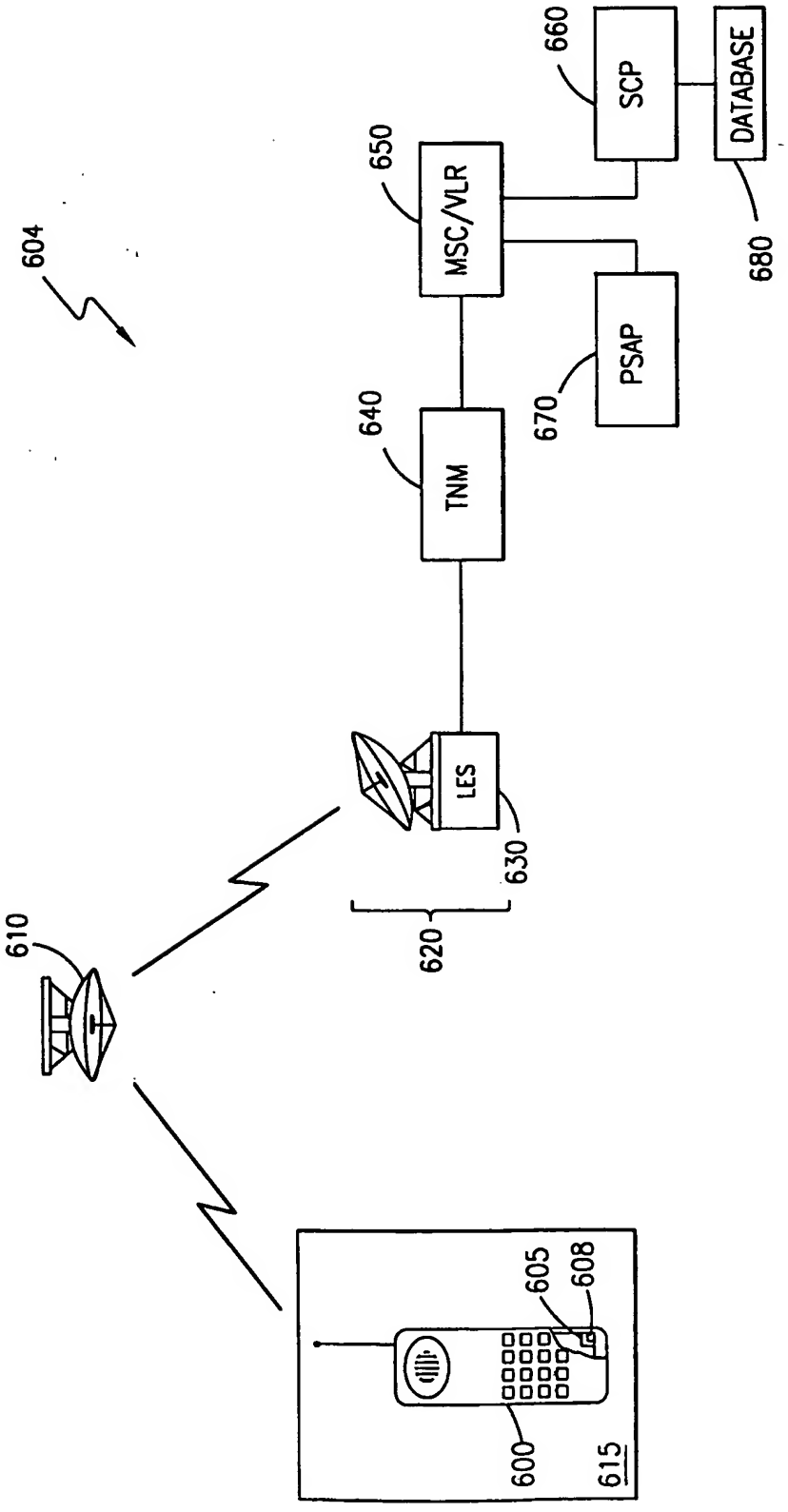
604
610
620
630
640
650
660
670
680
600
605
608
615
LES
TNM
MSC/VLR
SCP
DATABASE
PSAP

FIG. 6

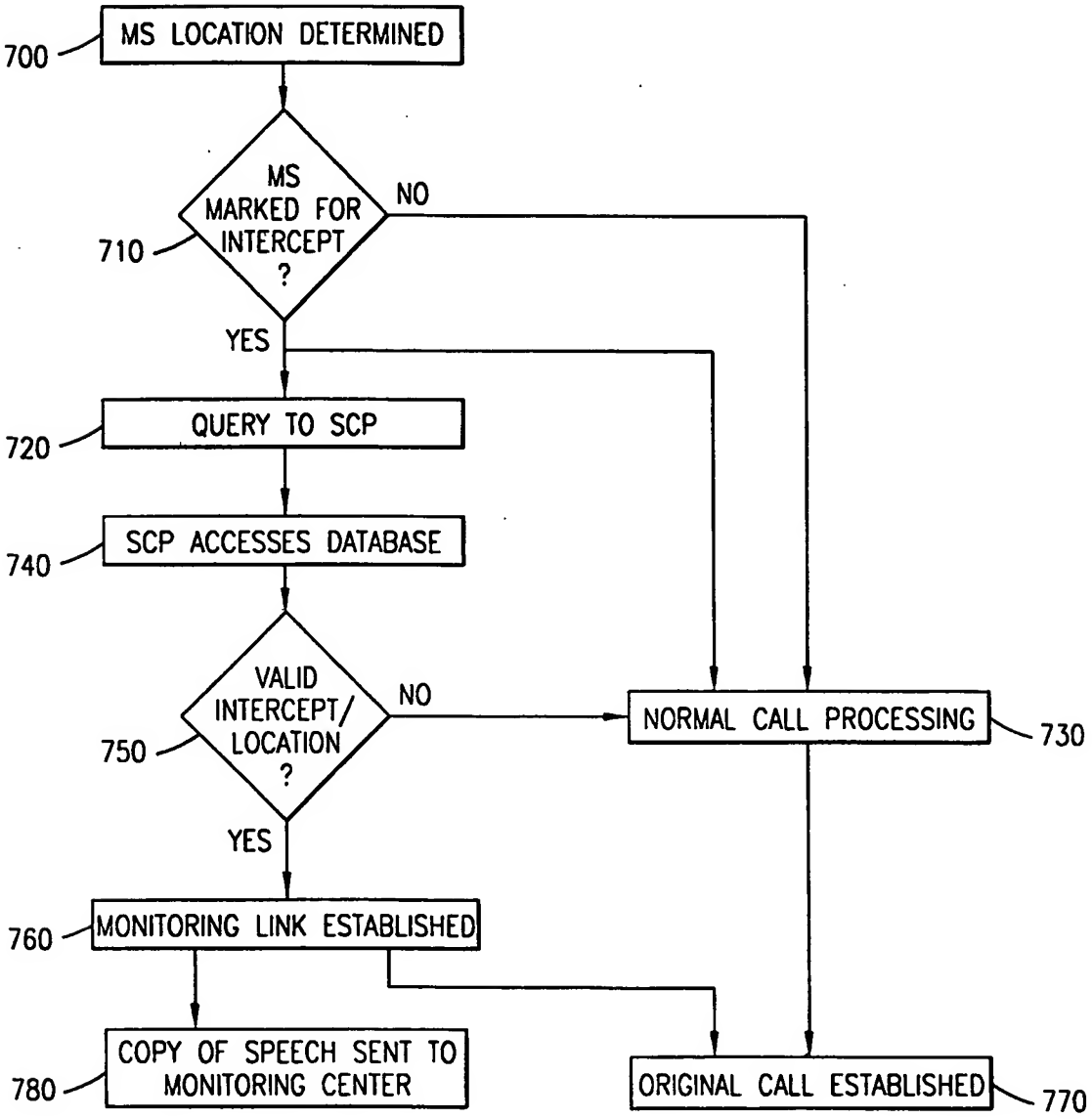
MS LOCATION DETERMINED
700
MS MARKED FOR INTERCEPT ?
710
NO
YES
QUERY TO SCP
720
SCP ACCESSES DATABASE
740
VALID INTERCEPT/ LOCATION ?
750
NO
YES
NORMAL CALL PROCESSING
730
MONITORING LINK ESTABLISHED
760
COPY OF SPEECH SENT TO MONITORING CENTER
780
ORIGINAL CALL ESTABLISHED
770

FIG. 7

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 98/24995

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 H04Q3/00 H04M3/42 H04M3/20 H04Q7/22

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 H04Q H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 95 26114 A (TELEFON AB LM ERICSSON) 28 September 1995	1,12-14, 16-19, 21,22, 24,25, 34-39,41
Y	see page 3, line 3 - page 4, line 7 see page 5, line 20 - page 7, line 10 see page 9, line 19 - line 33 see page 12, line 16 - line 26 see page 29, line 8 - line 31; figure 3 --- -/--	2-8,20, 23, 26-30, 40,42

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
1 April 1999	15/04/1999

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Vercauteren, S

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 98/24995

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5 590 171 A (HOWE W ET AL) 31 December 1996 see column 1, line 9 - line 11 see column 3, line 20 - line 26 see column 3, line 40 - column 4, line 25	2-8, 26-30,42
Y	WO 97 21296 A (MOTOROLA INC) 12 June 1997 see page 1, line 17 - line 33 see page 5, line 26 - page 9, line 34; figure 2	20,23,40
X	WO 94 29995 A (MOTOROLA INC) 22 December 1994 see page 4, line 6 - page 5, line 6 see page 6, line 8 - line 16 see page 16, line 1 - page 22, line 23; figure 4	1,9,10, 21,22, 24,25, 31,32,39
X	US 5 388 147 A (GRIMES G J) 7 February 1995 see column 1, line 20 - line 51 see column 2, line 16 - line 55 see column 4, line 59 - column 6, line 50; figure 1	1,9,10, 21,22, 24,25, 31,32,39
A	US 5 412 711 A (HAYASHI) 2 May 1995 see column 1, line 8 - line 15 see column 2, line 3 - line 22	1,11,25, 33

1

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/US 98/24995

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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		AU 7095594 A	03-01-1995
		CA 2139514 A	22-12-1994
		MX 9404431 A	31-01-1995
US 5388147 A	07-02-1995	NONE	
US 5412711 A	02-05-1995	JP 7087196 A	31-03-1995